FORCEnet engineering conference

November 15 – 18, 2005

Horizontal Fusion

An Operational Implementation of Enterprise Services

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Net-Centric Enterprise Services (NCES) / FORCEnet Composeable Services Abstract

Statement A: Approved for public release; distribution is unlimited (1 NOVEMBER 2005)

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Purpose

To describe current efforts at SPAWAR Systems Center Charleston to integrate and demonstrate DISA's NCES as part of the Horizontal Fusion effort

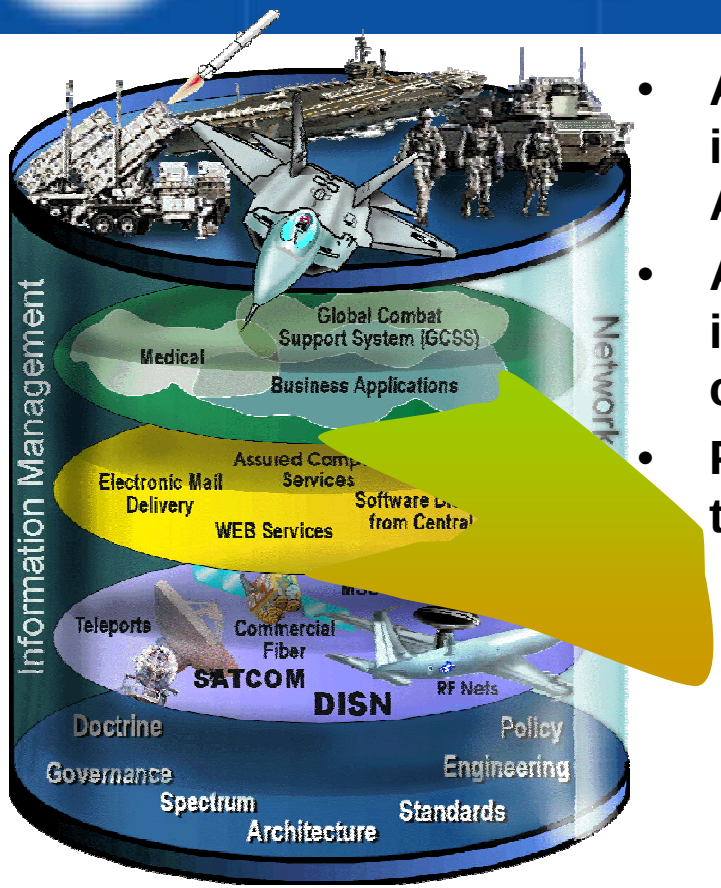
Nearly Three Years of Horizontal Experience

Background

- **Horizontal Fusion Portfolio was established by the ASD(NII) in Jan 2003**
- **Tasked to explore and investigate the feasibility of creating and implementing an interoperable Net-Centric environment**
- **SPAWAR Systems Center Charleston selected as the “test bed” for development, test and integration, and characterization of a Net-Centric environment and SOA, and to provide Chief Engineering services**
- **Horizontal Fusion recognized as DoD’s first enterprise SOA instantiation and reached IOC in Mar 2005**
- **Horizontal Fusion Core services founded on NCES – one of NCES’ first external users – currently using v0.4.1**
- **Assisted the Joint Interoperability Test Command in defining SOA operational test measures/metrics for GIG-BE FOT&E and NCES DT&E**

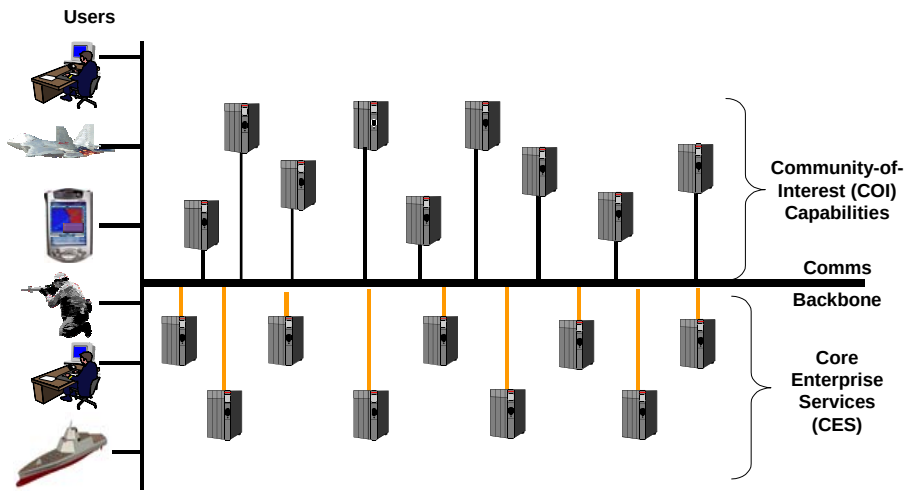
Horizontal Fusion Founded on NCES

What IS Horizontal Fusion



Horizontal Fusion is focused on the application & computing layer of the Global Information Grid

- **An accelerant for the operational implementation of the GIG Services Oriented Architecture**
- **A Pathfinder for NCES – Find the SOA implementation pitfalls and recommend vector checks in specifications/developers guidance**
- **Provide funds to Programs of Record to modify their operational baselines to join the SOA**



A Portfolio – Not a Program

Horizontal Fusion
Current Initiatives (1/2)

Name	Services Provided	Sponsor
Basic Language Translation Services (BLTS)	Provides language translation services (printed documented and speech) and makes available information via Warrior's Edge	United States Army G2, Army Research Laboratory (ARL)
Collateral Space	Is a globally accessible, shared information space providing improved and increased visibility to intelligence and operations information through a standards-based interoperability framework	Defense Intelligence Agency (DIA)
Content Staging	Provides discovery, indexing, retrieval, storage, and publish-subscribe services (smart pull) of information products critical to the warfighter in intuitive, Web-browser form. Currently operational at 30 locations including Operation Enduring Freedom	Defense Information Systems Agency (DISA)
Department of State: Net-Centric Diplomacy	Enhances the warfighter, mission planner, and combatant commander's ability to gain situation understanding about adversaries and their operating environment by providing a full range of diplomatic reporting	Department of State (DoS)
Environment Visualization (EVIS)	Produces forecasted weather effects on tactical missions and makes these available and advertised. This enables a user to access high resolution, mission-tailored weather effects summaries and related map overlays within their tactical decision-making cycle	Naval Research Laboratory (NRL
Tearline Reporting (TLR)	Identifies and extracts the sanitized section (tearline) of intelligence reports and posts (or disseminates) them, with near real-time posting in a database format that is exploitable by federated search and other Web services	United States Army Information Security Command (USAINSCOM)
FusionNet	Provides leaders, staff, and individual soldiers at the company through corps echelons with an integrated application suite to manage their units, plan and execute deployments and tactical operations	United States Army, XVIII Airborne Corps

Legacy Programs Successfully Converted to SOA Services

Horizontal Fusion
Current Initiatives (2/2)

Name	Services Provided	Sponsor
Joint Cross Domain eXchange (JCDX)	Supports the customers of the U.S. and partner Joint Intelligence Centers with information tailored to their clearance level, area of interest, and need to know. This is the only operational command, control, communications, computers, and intelligence systems	United States Navy
Knowledge Management in a Net-Centric Environment (KMINCE)	Provides a web-accessible, multilingual environment where analysts/users can collaborate, build, and post intelligence products based on the National Ground Intelligence Center's (NGIC's) digital production program	National Ground Intelligence Center (NGIC)
Multi-Sensor Aerospace-Ground Joint ISR Interoperability Coalition (MAJIIC)	Enhances U.S. joint and coalition intelligence, surveillance, and reconnaissance (ISR) data interoperability. Facilitates information sharing via the development, testing, and implementation of data standards, XML schemas, and leading edge Web-based services	United States Joint Forces Command (USJFCOM)
Net-Centric Geospatial-Intelligence Services (NGS)	Provides warfighters and senior policymakers with access to geospatial intelligence (GEOINT) and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on Earth	National Geospatial-Intelligence Agency (NGA)
Trusted Wisdom	Provides secure, mobile, real-time posting of reporting from field collectors. Information is tagged, enabling communities of interest to host rapid analysis and fusion of field collector reporting and technical collection data	Defense Intelligence Agency (DIA)
Visualization Information Dominance (V/ID)	Bridges traditionally separate analytic processes, including data preparation and exploitation, and Web-enables it through data extraction, analysis, and tagging via the commercial ClearForest ClearTags entity extractor	United States Army Intelligence and Security Command (USAINSCOM)
Non-Obvious Relationship Awareness (NORA)	Discovers relationships among people and organizations to answer the question, "Who knows whom?" Accessed by the warfighter through the Mars Portal	SPAWAR Systems Center, Charleston

HF Back-plane

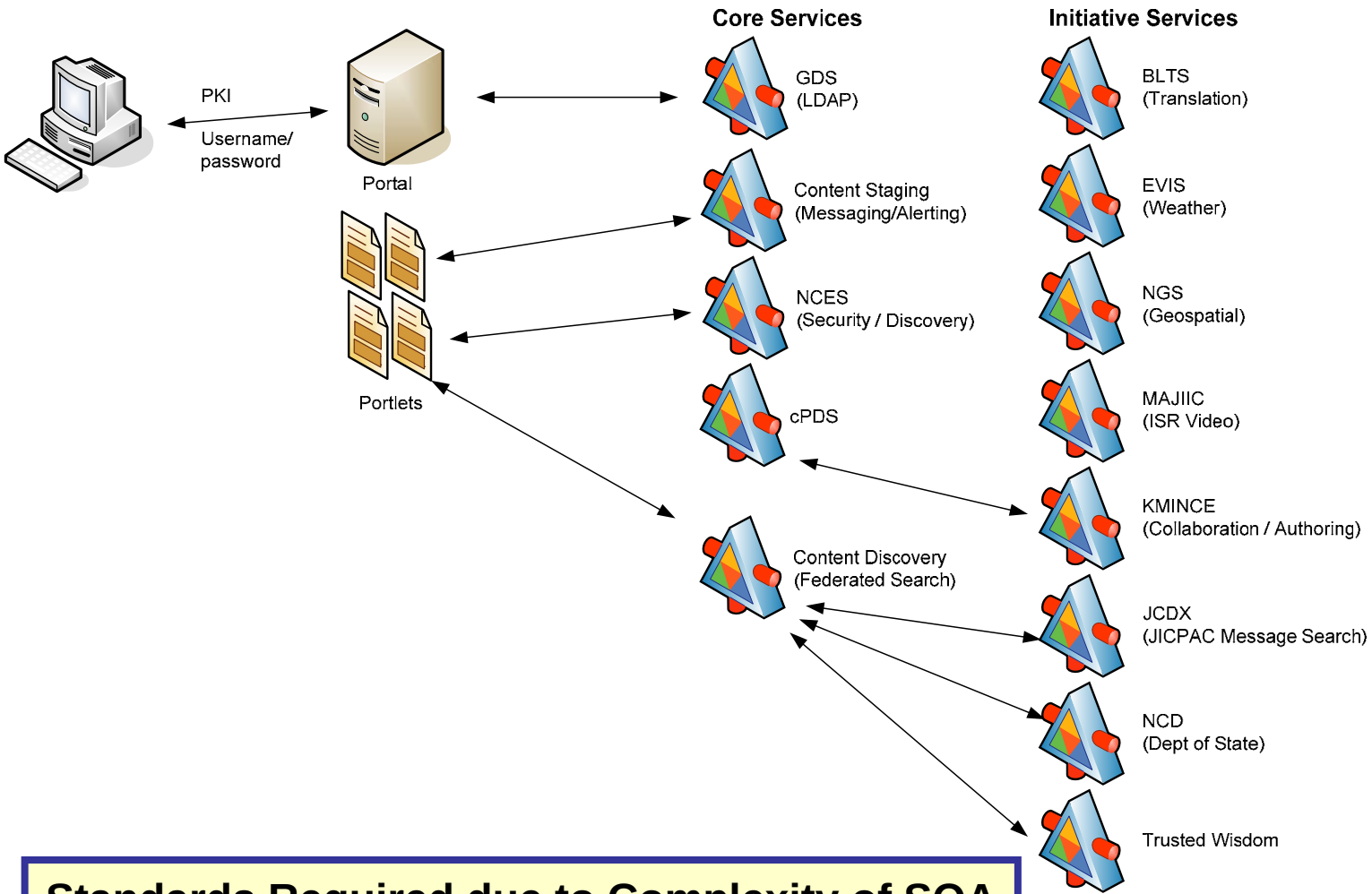
	Category	Service
Core Enterprise Services	Security	•NCES Security Services v0.4.1 •Classification Policy Decision Service •Security Adjudication Service
	Discovery: Services	•NCES Service Discovery Service v0.4.1
	Discovery: Content	•Federated Search •Registration Web Service
	Discovery: Person	•Person Discovery Service
	Mediation: Messaging	•NCES Messaging Bus •Alerts Application Service
	C2 Visualization	•XTCF Track Mediation Service 3.4.05 •C2Vis WebCOP v 4.2
Specifications	•NSS v0.3 •NSDS v0.3 •Content Discovery v1.3 •RWS v1.1.0 •PDS v1.0.6 •Person Spec v1.0 •EVXS v1.0.7 •JAX-R v1.0 •Messaging Spec v1.2	•Open GIS Consortium (OGC) •WFS v1.0 •WMS v.1.1.1 •WRS v0.0.2 •ISO 19115 •MILSTD-2525 •Alerts Spec v1.0 •CTDS v1.0 •HFO v1.0 •DDMS v1.0.0.6

Commercial Standards

- •Java2 Enterprise Edition v1.4.2_06
  - •EJB
  - •JAX Pack
  - •JNDI
  - •JMS
- •Web Services
  - •WSDL v1.1
  - •SOAP v 1.1
  - •JSR-170
- •Security
  - •SAML v1.0
  - •PKI (TWG 98-07) v1.5
  - •WS-Security
- •Registry/Directory
  - •RDF/UDDI v2
  - •LDAP v3.0
- •Data Standards
  - •XML/XSLT v1.0
  - •OWL v1.0
  - •WebDAV RFC-2518, 3253
- •Syndication
  - •RSS v1.0
  - •WS-Eventing v2.0
- •Rendering
  - •HTML v3.2/4.0
  - •CSS v1.0
  - •JSR-168
- •Transport
  - •SSL v3.0
  - •HTTP/S
  - •DIME
  - •SNMP/S

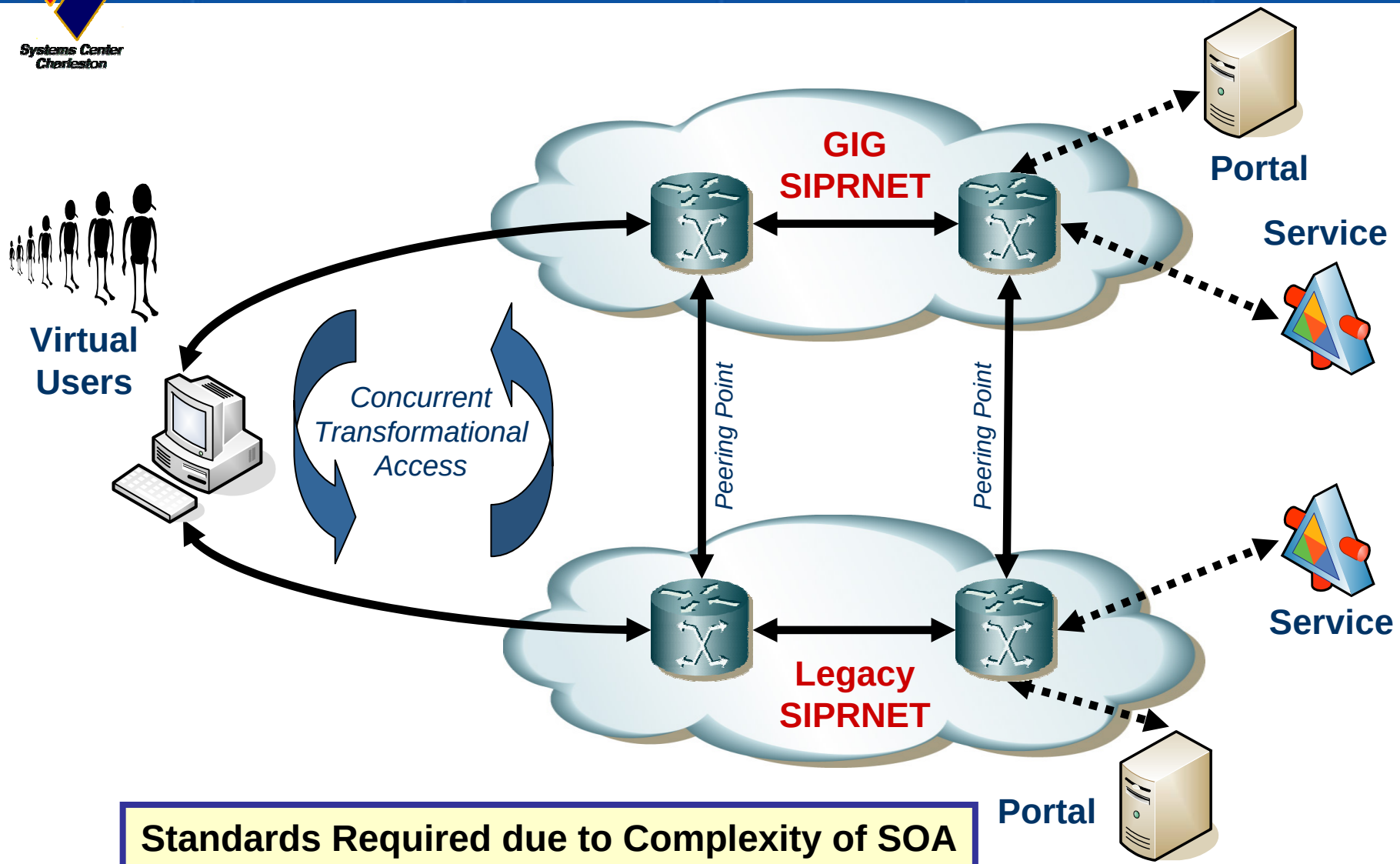
Adoption of Standards Accelerated Development

HF Infrastructure Services



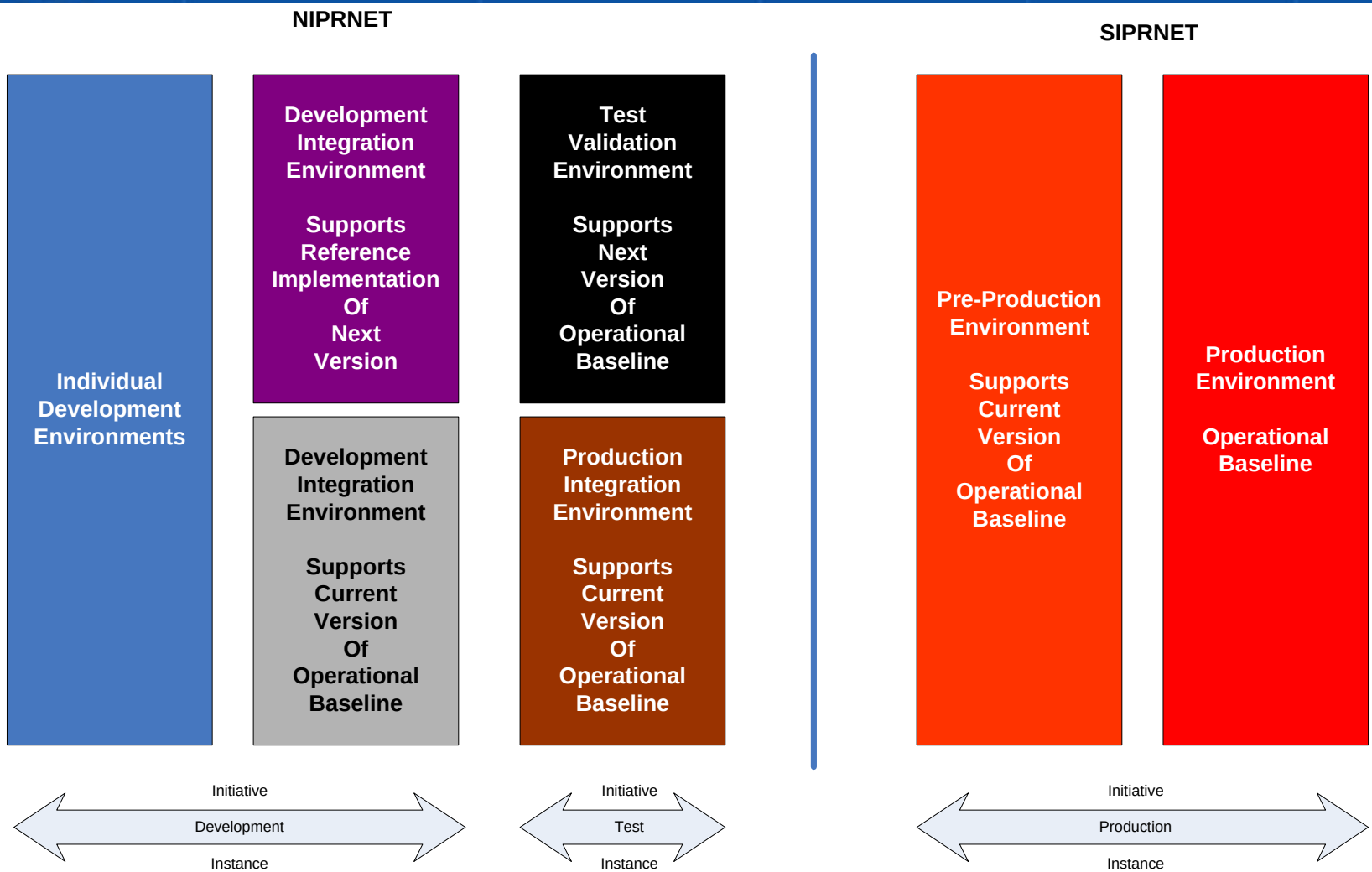
Standards Required due to Complexity of SOA

GIG-BE Transformational User Network Assessment



Standards Required due to Complexity of SOA

SOA Test and Integration Environment



Lesson Learned - Scalable Process

Other Lessons Learned

- Characteristics of a service varies
- Technology gaps and standardization
- Appropriate role-based security/IA

Lessons Learned – Evolutionary Process

Conclusion

Continuing to contribute to NCES

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Positioned to achieve NCES alignment for building a common network interface to the Navy as well as to Joint and Coalition domains